REMARKS

Applicants have added new Fig. 5 to illustrate a tooth-slot structured stator as required by the Final Rejection, and has added a Fig. 5 description to the Brief Description of the drawings as well as a reference to Fig. 5 on page 4 of the specification.

Applicants have not amended the claims in response to the Final Rejection of October 24, 2003 because the claims, as currently configured and as originally filed recite "a disk" meaning a single disk. In view of the specification and drawings, the article "a" means "one" and does not include a plurality of disks. Note that both primary references Sakuragi et al. '047 (see Figs. 13-15 and col. 2, lines 49-59) and Dunfield et al. '268 (see col. 2, lines 31-40 and all Figs.) disclose hubs with pluralities of disks and therefore teach away from Applicants' invention as recited in independent claims 1 and 2. This is because in both references minimizing thickness is not a consideration. Clearly, the limitation "a disk" is not a limitation which can be ignored when the title of the invention, the entire specification, and the drawings are directed to "an ultra-slim structure" for a disk-spindle motor. While it is respectfully submitted that the term "a" in Applicants' claims clearly means "one", Applicants are willing to include clarifying amendments to further emphasize this difference between independent claims 1 and 2 and the primary references, Sakuragi et al. '047 and Dunfield '268.

In support of Applicants' contention that "a disk" means a single disk, the Examiner's attention is directed to each of the drawing figures, none of which illustrate more than one disk. Next, the Examiner's attention is directed to Applicants' Background of the Invention where the need for an ultra-slim, disk-spindle motor configuration is set forth to enable a

Type I expansion slot of 3.3 mm to receive motor-spindle disk drive. The challenge is to reduce the thickness of a Type II motor-spindle disk drive of 5.0 mm (Fig. 1) to a thickness of less than 3.3 mm. Applicants have done this in part by the following structure recited in independent claims 1 and 2:

(Claim 1)

> a cylindrical hub with both ends open, the cylindrical hub having an inner protruding portion from a central portion of an inner circumferential face of the hub and an outer protruding portion protruding from an upper side of the outer circumferential face of the hub, the inner protruding portion being fixedly provided between the lower ball bearing and the upper ball bearing;

(Claim 2)

> a cylindrical hub with both ends open, the cylindrical hub having an outer protruding portion protruding from an upper side of an outer circumferential face of the hub and an inner protruding portion protruding form a lower side of an inner circumferential face of the hub, the cylindrical hub spaced by a certain interval from the thrust pad;

These limitations when combined with the other limitations enable Applicants to minimize the thickness of their disk-spindle motor from the prior art thickness of 5.0 mm to a prototype thickness of 2.5 mm so that the motor-disk spindle can fit in a 3.3 mm slot. This is clearly not a distinction without a difference because, as is stated in Applicants specification at page 7, lines 3-7, the resulting motor-disk spindle enables:

> ...the micro drive to be manufactured in the Type I of PCMCIA.
>
> (and further)
>
> ...this ultra-slim spindle motor would be installed even at a personal digital assistant (PDA), a digital camera and so on.

Would one skilled in the art at the time the invention was made consider prior art necessarily directed to thicker motor-disk assemblies accommodating a plurality of disks to solve the problem of making thin disk assembly even thinner? No, not in the absence of Applicants' teachings. Even if Sakuragi et al. '047 and Dunfield et al. '268 teach some aspects of Applicants' claims, and they do not, using their structure would be evidence of patentability, not unpatentability, because by teaching a plurality of disks, each primary reference teaches away from Applicants' claimed invention. Neither primary reference addresses Applicants' problem of making thin disk-spindle motors even thinner, so one skilled in the art would not consult the teachings of these references to solve the problem.

Considering Sakuragi et al. '047 first, in addition to being directed to a plurality of disks instead of "a disk", Sakuragi et al. '047, as previously argued, is directed to the brushless motor of the outer rotor-type that fixes a rotor magnet on an inner circumference of a cylindrical recess formed in a hub having a plurality of magnetic disks, and reduces a electromagnetic noise and a PWM noise. Sakuragi et al. '047 locates sealing components such as an upper magnetic fluid seal 11, and a lower magnetic fluid seal 18 over and under the bearings to prevent debris from entering into the bearings 7 and 8. Thus Sakuragi et al. '047 is not concerned with the thickness of a spindle motor. Furthermore, in Sakuragi et al. '047, the clamp 37 is provided only to fix the disks. Sakuragi et al. '047 does not disclose the clamp performing both sealing and fixing of a single disk simultaneously which is accomplished by Applicants configuration. Clearly, Sakuragi et al. '047 is not a primary reference one skilled in the art would consult to solve their problem of making a disk-spindle motor thinner.

With respect to claim 1, the rejection attempts to cure the defects of Sakuragi et al. '047 by first combining it with another reference which also teaches away from the concept of a single disk, i.e. Dunfield et al. '268. As previously argued Dunfield et al. '268 discloses a hub 154, however, Dunfield et al. '268 refers to and is concerned specifically with a spindle motor which applies an overmold to a stator in order to smooth a surface of the stator 156 and to reduce acoustic noise. Moreover, Dunfield et al. '268 places the sealing regions over one bearing 160 and under the other bearing 162 to prevent debris from entering into the bearings 160 and 162. In contrast, in Applicants' invention, the cylindrical hub 250 is open-ended on both upper and lower sides and the clamp 280 is fixed to the hub. Thus, the clamp 280 performs both sealing and fixing of the disk simultaneously, thereby allowing the present invention to provide an ultra-slim spindle motor which prevents an increase in thickness caused by the sealing region. (See Figs. 2a and 2b). Therefore, in Applicants' invention the spindle motor can be mounted in a small size personal digital assistant (PDA), a digital camera, and so on because the upper end portion of the hub of the spindle motor is eliminated in the ultra-slim spindle motor. (See page 7, lines 3-7).

In the absence of Applicants' disclosure, there would be no reason to combine Dunfield et al. '268 with Sakuragi et al. '047 with either of these references being the primary reference.

With the combination of Sakuragi et al. '047 and Dunfield '268 in either order, the Examiner combines Takemura '545 as teaching a stator bonded to "an upper end portion of an inner circumferential face of the circular hole" in the base plate. There is nothing in Takemura '545 which teaches or suggests that using structures in Takemura '545 would help solve the problem of making disk-spindle motors thinner. Note in Fig. 19 that

Takemura '545 has a plurality of disks 214 which is counter to Applicants concept of "a disk" i.e. a single disk. Moreover, as previously argued Takemura refers to and is concerned specifically with a spindle motor which can prevent a leakage of a lubricant included in the bearings 208 and 251 during rotation of the motor. Takemura et al. '545 applies a ring-shaped sealing member 222, a ferro-fluid sealing device 216 and a cap 215 to the spindle motor. Furthermore, the sealing component is located under the bearing to prevent debris from entering into the bearings 208 and 251. Thus, Takemura et al. '545 is not concerned with the thickness of a spindle motor nor disclose the ultra-slim spindle motor performing both sealing and fixing of a disk at the same time.

Three references not being enough to establish a *prima facie* case of obviousness the rejection includes fourth and fifth references, Aimiya '655 and Lee '144, respectively.

While Aimiya '655 does disclose only a single disk, Aimiya '655, like the prior art of Applicants Fig. 1, does not attempt to reduce the thickness of the disk-spindle motor, rather Aimiya '655 is interested in reducing the diameter of the housing and using the space inside the cover effectively. To this end Aimiya '655 places a hub 15 over a bearing to prevent debris from entering into the bearings 12 and 13. A stator unit 18, a pole 17 and yoke 19 are then located over the hub. Thus, Aimiya '655 is not concerned with the ultra-slim thickness of a spindle motor at all. Furthermore, in Aimiya '655, the clamp 16 is provided only to fix the disk. Aimiya '655 does not disclose the clamp performing both sealing and fixing of a disk at the same time. Moreover, the differences between Applicants' claimed structure and Aimiya '655 are legion. For example, Applicants' stator is bonded to an upper end portion of an inner circumferential face of the circular hole in the base, whereas in Aimiya '655 the stator is located in the cover. In Applicants' invention the

shaft 320 is formed unitarily with the housing, whereas in Aimiya '655 the shaft (i.e. spindle 14) rotates with the disk. Clearly, Aimiya '655 has a substantially different structure than Applicants claimed structure and does not address specifically making a disk-spindle motor with a single disk thinner.

Finally, the rejection relies on Lee et al. '014 which is also not interested in thickness in that Lee '014 has a hub 128 for driving a plurality of disks. Note that in the Office Action it is stated that 137a is a clamp. This is not the case at all because 137a is the cover (See col. 4, line 34 of the disk-spindle motor). Moreover, as previously argued Lee et al. '014 refers to and is concerned specifically with high speed performance of a spindle motor. The spindle motor of Lee et al. '014 includes a hub sleeve 162b and a stationary sleeve 166b located with an appropriate gap therebetween to smoothly perform a pumping action smoothly. In order to prevent leakage of air or oil between a thrust plate 142b and a main hub 128b, a containment plate 154b is located on an upper portion of the spindle motor. In other words, to prevent a "leak out" from incurring in the veering regions 128b and 142b, a sealing component such as a containment plate 154b is located over the bearing, and thus Lee et al, '014 does not disclose the ultra-slim structure as recited in claims 1 and 2 of the present invention.

In contrast, in Applicants' invention, the cylindrical hub 350 is open-ended on both upper and lower sides and the clamp 380 is fixed on the hub. Thus, the clamp 380 performs both sealing and fixing of a disk simultaneously and thereby allows the present invention to provide an ultra-slim spindle motor which prevents a thickness increase due to the presence of the sealing region.

Also, in Applicants' invention, the stator 330 is bonded to an upper end portion of an inner circumferential face of the circular hole of the base plate 300, while, in Lee et al. '014, the annular stator 176b is connected to the base member. Furthermore, in Lee et al. '014, the spindle motor 120b includes a containment plate 154b to block the fluid, while, in the present invention, the clamp 280 serves as the containment plate 154b, thereby forming an ultra-slim disk spindle motor.

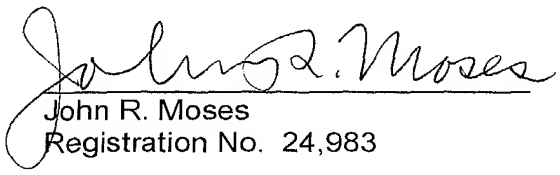
Clearly, with respect to independent claims 1 and 2, a *prima facie* case of obviousness has not been established by this combination of 5 references, none of which are concerned with making a disk-spindle motor thinner. The only way these bits and pieces would be combined to create Applicants' claimed invention is to use Applicants claims as a template, which is not permissible in formulating a rejection.

Dependent claims 3-11 further limit independent claims 1 and 2 and are therefore allowable for the same reasons as claims 1 and 2.

In that this is a full and complete response to the Final Rejection of October 24, 2002, this application is now in condition for allowance. If the Examiner for any reason feels a personal conference with Applicants' attorneys might expedite prosecution of this application, the Examiner is respectfully requested to telephone the undersigned locally.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please **amend** the specification as follows:

On page 4, the fourth full paragraph has been amended as follows:

Fig. 3b is a detailed view of the portion "B" in Fig. 3a; ~~and~~

On page 4, the fifth full paragraph has been amended as follows:

Fig. 4 is a plan view of a prototype of an ultra-slim disk-spindle motor in accordance with the one preferred embodiment of the present invention~~.~~ , and

On page 4, paragraph 12 has been amended as follows:

The stator 230 comprises a tooth-slot structure iron core 230a and a winding 230b wound around the core and is bonded to an upper side of an upper side of an inner circumferential face of the circular hole of the base plate 200 (see Fig. 5).